Naval Submarine Base New London

SITE 3 - AREA A DOWNSTREAM WATERCOURSES, SITE 7 - TORPEDO SHOPS, SITE 14 - OVERBANK DISPOSAL AREA NORTHEAST, SITE 15 - SPENT ACID STORAGE AND DISPOSAL AREA, SITE 18 - SOLVENT STORAGE AREA, AND SITE 20 - AREA A WEAPONS CENTER GROUNDWATER
PROPOSED PLAN

Introduction

In accordance with Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the law more commonly known as Superfund, this Proposed Plan summarizes the Navy's preferred options for addressing **groundwater** at the Area A Downstream Watercourses (Site 3), Torpedo Shops (Site 7), Overbank Disposal Area Northeast (Site 14), Spent Acid Storage and Disposal Area (Site 15), Solvent Storage Area (Site 18), and Area A Weapons Center (Site 20) at Naval Submarine Base - New London (NSB-NLON) (Figure 1). The **groundwater** at Sites 3, 7, 14, and 20 is hydraulically connected due to the proximity of the sites to one another. The **groundwater** at Sites 3, 7, 14, 15, 18, and 20 is only a portion of the basewide **groundwater Operable Unit** (**OU**) 9. The proposed remedial actions for the groundwater at these sites are considered interim actions and the remaining portions of **OU**9 will be addressed later in other decision documents. Final actions for **OU**9 will be selected after interim actions have been selected for all portions of **OU**9. These sites are 6 of 25 sites being addressed by the Navy's **Installation Restoration (IR)** Program at NSB-NLON. The **IR** Program is being conducted to identify and clean up sites created by past operations that do not meet today's environmental standards.

The Cleanup Proposal...

After careful study of **groundwater** at Sites 3, 7, 14, 15, 18, and 20, the Navy proposes the following interim plan:

Groundwater at Sites 3 and 7

- Implement institutional controls that identify the location and magnitude of **groundwater contamination** and restrict extraction and use of the **groundwater**.
- Monitor the degradation and potential migration of **groundwater** contaminants by natural processes until they decrease to levels at which unrestricted use of **groundwater** may be permitted.

Groundwater at Sites 14, 15,18, and 20

- No Further Action (NFA).

Learn More About the Proposed Plan

The Navy will describe this Proposed Plan and hear your questions at an informational public meeting.

October 05

PUBLIC MEETING

Meeting: 6:30 pm
Hearing: 7:00 pm
Date: Tuesday October 5, 2004
Location: Best Western Olympic Inn, Route 12, Groton, Connecticut

A formal public hearing will immediately follow this meeting.

For further information regarding the public meeting and hearing, call Ms. Melissa Cokas with the NSB-NLON Environmental Department at (860) 694-5191.

What Do You Think?

The Navy is accepting public comments on the Proposed Plan for **groundwater** at Sites 3, 7, 14, 15, 18, and 20 from September 24, 2004 to October 25, 2004. You do not have to be a technical expert to comment. If you have a comment or concern, the Navy wants to hear it before making a final decision.

There are two ways to formally register a comment:

1. Offer oral comments during the October 5, 2004 public meeting and hearing, or
2. Send written comments postmarked no later than October 25, 2004 following the instructions provided at the end of the Proposed Plan.

To the extent possible, the Navy will respond to your oral comments during the October 5, 2004 public meeting and hearing. In addition, regulations require the Navy to respond to all formal comments in writing. The Navy will review the transcript of the comments received at the meeting, and all written comments received during the formal comment period, before making a final decision and providing written responses to the comments in a document called a **Responsiveness Summary**. The **Responsiveness Summary** will be included in the **Record of Decision (ROD)**.

Technical terms shown in bold print are defined in the glossary on Page 19.

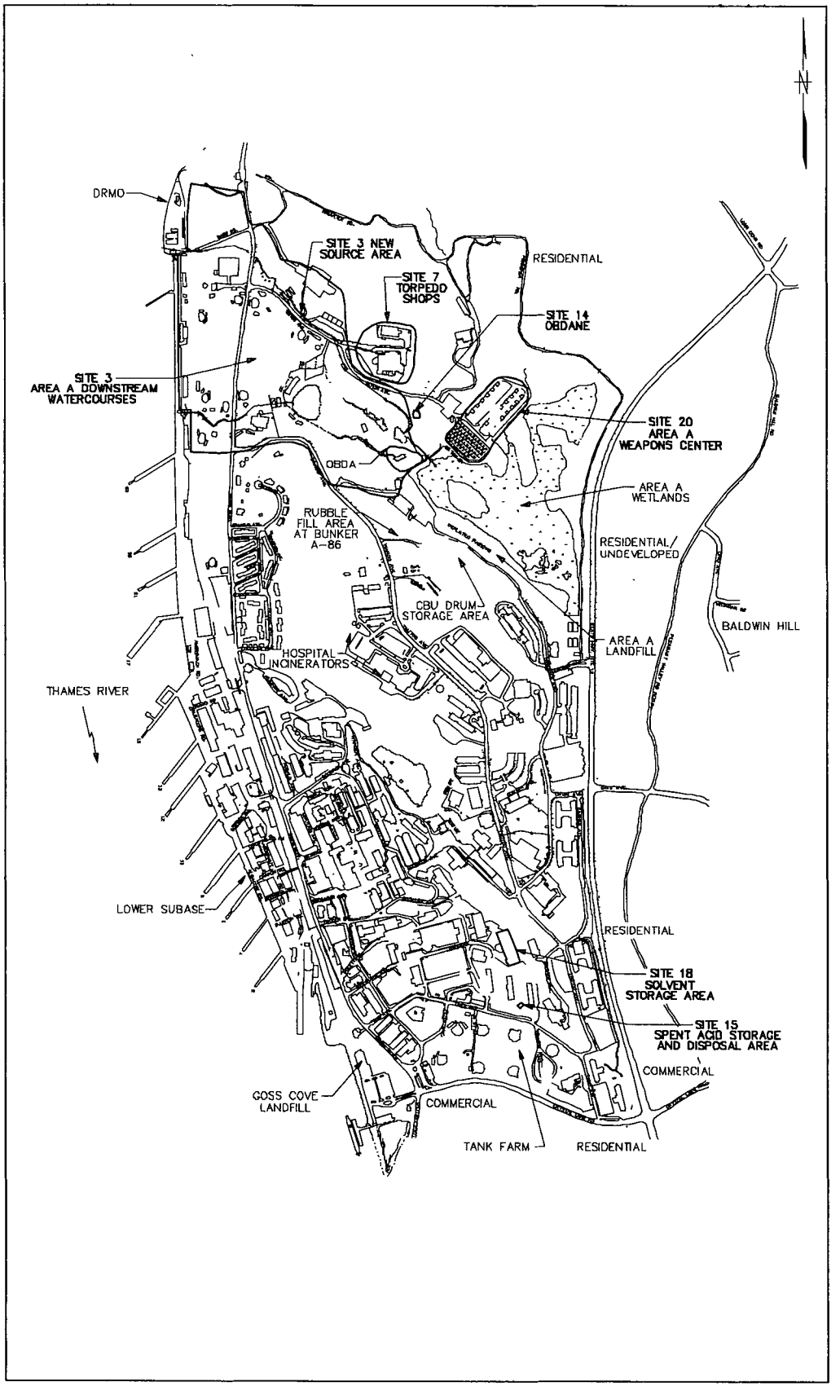

Figure 1. Site Location Map

Detailed descriptions of the sites are provided in the **Basewide Groundwater Operable Unit Remedial Investigation (BGOURI)** Report (January 2002) and the **BGOURI** Update/**Feasibility Study** (**FS**) Report (July 2004) which are available in the Information Repositories at the locations identified on Page 18. Remedies for the **groundwater** associated with the other sites investigated during the **BGOURI** will be provided in separate decision documents. The soil and **sediment** associated with Sites 3 and 20 were addressed under **OU**3 and **OU**7, respectively. A Non-Time-Critical Removal Action (NTCRA) was conducted to address the soil at Site 14, and the soil associated with Sites 7 and 14 were addressed under **OU**8. The soil associated with Site 15 (**OU**6) and Site 18 (**OU**11) were addressed in NFA **RODs** in 1997 and 2004, respectively.

This Proposed Plan recommends interim measures of institutional controls and **monitoring** for the **groundwater** at Sites 3 and 7. The recommendation is based on the **RI** report's conclusion that there were no significant risks to current human or ecological receptors, but there are potentially significant risks to hypothetical future human receptors from routine, long-term consumption of contaminated **groundwater**. This Proposed Plan also recommends NFA for the **groundwater** at Sites 14, 15, 18, and 20. This recommendation is based on the **RI** report's conclusion that there were no significant risks to human health or the environment from current or future exposure to **groundwater** at these sites.

History

Site 3 covers approximately 75 acres and is located in the northern portion of NSB-NLON. The site contains mainly undeveloped wooded areas and recreational areas [golf course and lake for swimming (North Lake)]. The Site 3 watercourses include several small ponds and interconnected streams (Figure 2) that convey surface water to the Thames River. Site 3 also included the former Over Bank Disposal Area (OBDA). Site 3 was investigated during several phases from 1990 to 2002. The major **sources** of **contamination** to Site 3 included historic application of pesticides, abandoned disposal areas, and the septic system leach fields at Site 7. In March 1997, accumulated debris in the OBDA (Figure 2), including discarded wooden pallets, telephone poles, and empty tanks, was removed as part of a Time-Critical Removal Action (TCRA) and disposed off site. During 1999 and 2000, a remedial action (RA) was completed for a portion of Site 3 **OU**3. Approximately 18,050 tons of soil and **sediment** contaminated with pesticides and **metals** were excavated and disposed at off-site disposal facilities. The Site 3-New **Source** Area (NSA), discovered during the RA for Site 3 **OU**3, contains petroleum-contaminated soil. The site is a small disposal area on the hillside adjacent to Stream 5, and debris such as rusted drums and wire cable was found intermingled with soil and boulders at the site. An RA for the debris and contaminated soil at the site is planned for 2005.

Site 7 is the Torpedo Shops (Buildings 325, 450, 477, and 528) and is located in the northern portion of NSB-NLON on the northern side of Triton Road (Figure 2). The Navy conducts maintenance activities on torpedoes at the site. Site 7 soil will be addressed by the **ROD** for **OU**8. Site 7 media were investigated during several phases from 1990 to 2000. The major **sources** of **contamination** at Site 7 included potential historic disposal of solvents/chemicals into two on-site septic systems and leaks or spills associated with on-site underground storage tanks. Contaminated soil was found on the southern side of Building 325, and it appears to be related to former underground storage tanks used to store fuel oil. **Groundwater** and suspected soil **contamination** on the western side of the building appears to be related to the septic tank, sewer lines, or leach field associated with the former septic system. The underground storage tanks were closed in the 1990s, and the septic system was abandoned when sanitary sewers were installed in 1983.

Site 14 is a site where miscellaneous wastes were dumped in the past. It is located adjacent to Sites 3 and 7 in a wooded area on the edge of a ravine just north of Stream 3 (Figure 2). An NTCRA was completed at the site in 2001 to address the soil and miscellaneous wastes dumped at the site. Approximately 270 tons of material were removed and disposed off site, and the site was subsequently restored.

Site 15 is located in the southern portion of NSB-NLON (Figure 1). It is centrally located between the southern sides of Buildings 409 and 410 (Figure 3). This site was used before and after World War II for the temporary storage of waste battery acid in a rubber-lined underground tank. The tank was reportedly 12 feet long by 4 feet wide by 4 feet high. The batteries were placed on a concrete pad next to the tank onto which some acids occasionally leaked. No major spills were ever recorded. A 1951 aerial photograph showed that the area around the tank was not paved. Acid from the batteries was stored in the tank and was subsequently pumped into a tank truck and disposed in the Area A Landfill (Site 2).

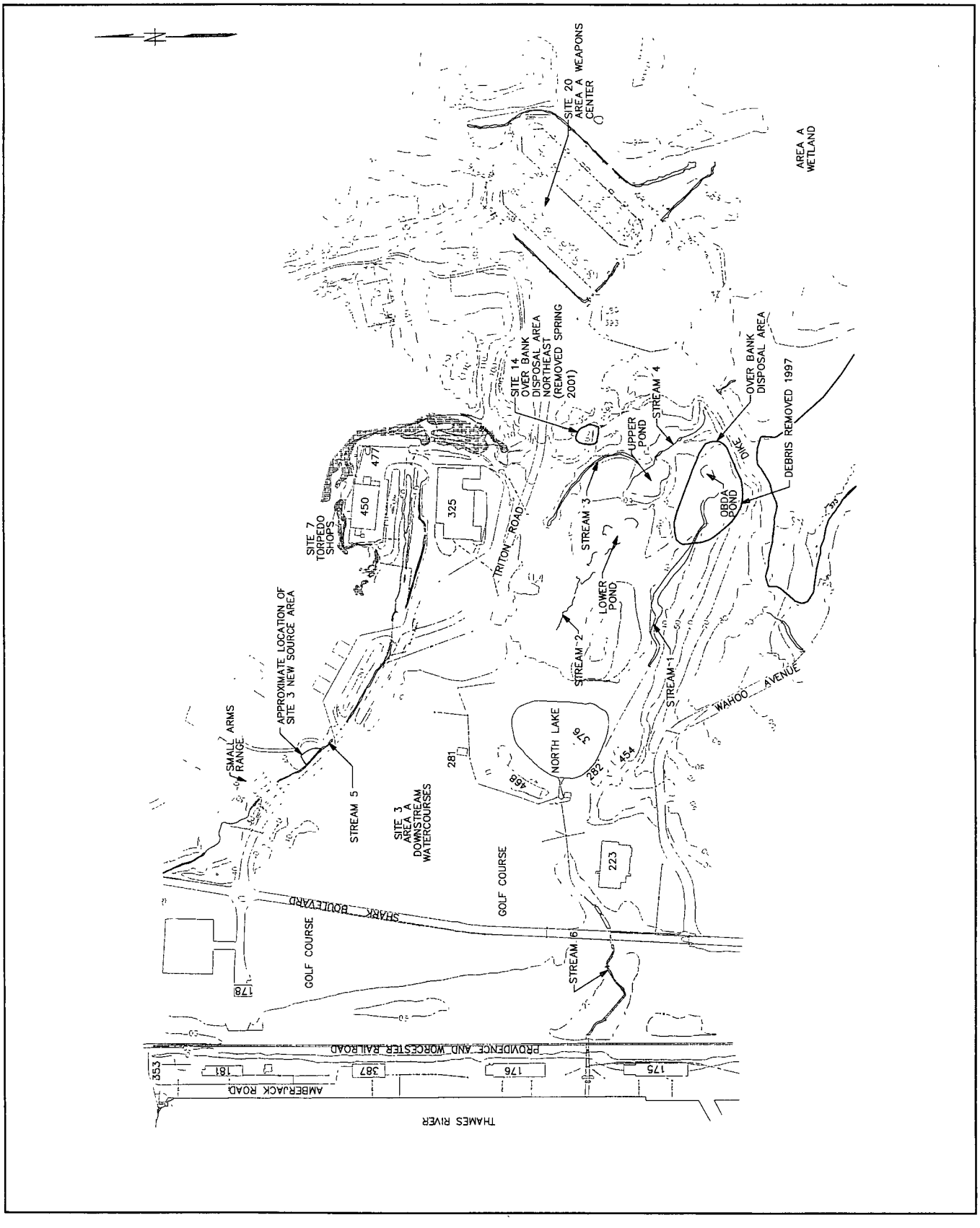

Figure 2. Sites 3, 7, 14 and 20 Layout Map

Historical investigations completed at Site 15 include the Phase I **Remedial Investigation (RI)** (1992), Focused Feasibility Study (FFS) (1994), Phase II **RI** (1997), Supplemental Sampling Event (1997) and **BGOURI** (2002). Based on the results of the Phase I **RI** and FFS, it was determined that a TCRA was necessary for Site 15. The removal action was completed in 1995 and included removal of the tank, its contents, and 318 tons of lead-contaminated soil. Subsequent to the TCRA, completion of the Phase II **RI**, and confirmation sampling, an NFA **Source** Control **ROD** was signed for **OU**6 at Site 15 in 1997. Additional **groundwater** samples were collected at the site during the **BGOURI** in 2000 and a **data gap investigation (DGI)** conducted at the site in the fall of 2002 for the **BGOURI Update/FS**.

Site 18 consists of Building 33, the Solvent Storage Area. The location of Building 33 is shown on Figures 1 and 4. This building has been used for the storage of gas cylinders and 55-gallon drums of solvents such as trichloroethene (TCE) and dichloroethene.

The Solvent Storage Area at Building 33 was identified during the IAS. The site was identified as Study Area F in the FFA and is now identified as Site 18 for the **IR** Program. **Groundwater** samples were collected from the site during the **BGOURI** (2002).

The Area A Weapons Center (Site 20) consists of Building 524 and the weapons storage bunkers. The site is located near the top of a local topographic and bedrock high (Figure 2). Building 524 is used for administration, minor torpedo assembly, and storage of simulator torpedoes. Small quantities of chemicals (cleaning and lubricating compounds, paints, and adhesives) and chemical waste generated by on-site activities are stored at the site. Liquid fuels present in the weapons storage bunkers include **Otto fuel II**, **JP-10**, and **TH Dimer** (jet rocket fuel). A small (less than 200 cubic yard) soil RA was conducted at the site in 2001 to address polynuclear aromatic hydrocarbon (**PAH**) and inorganic **contamination** in the soil and **sediment** (**OU**7).

Findings of the Field Investigations

The Navy conducted various field investigations at Sites 3, 7, 14, 15, 18, and 20 from 1990 to 2002 to assess the nature and extent of **groundwater contamination**. The investigations at Sites 3, 7, and 20 focused on the **groundwater** present in the overburden and bedrock, and the investigations at Sites 14, 15, and 18 only focused on the **groundwater** in the overburden. Overburden and bedrock **groundwater** potentiometric contours and flow di-

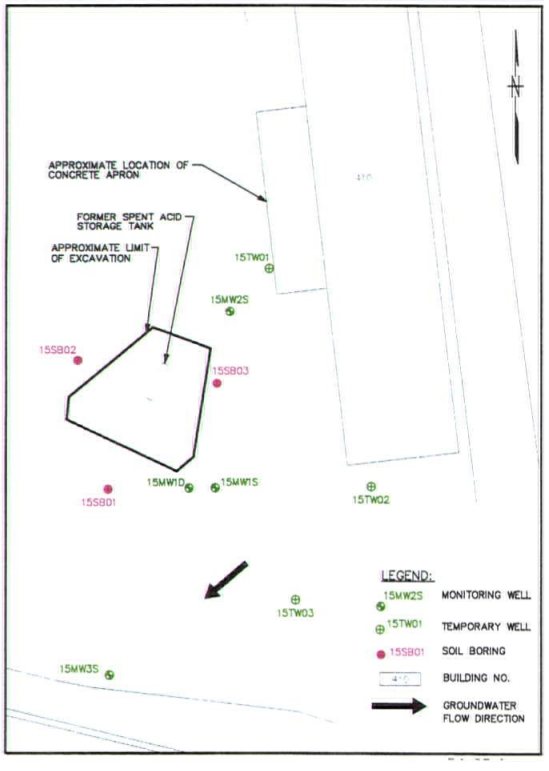

Figure 3. Site 15 Layout Map

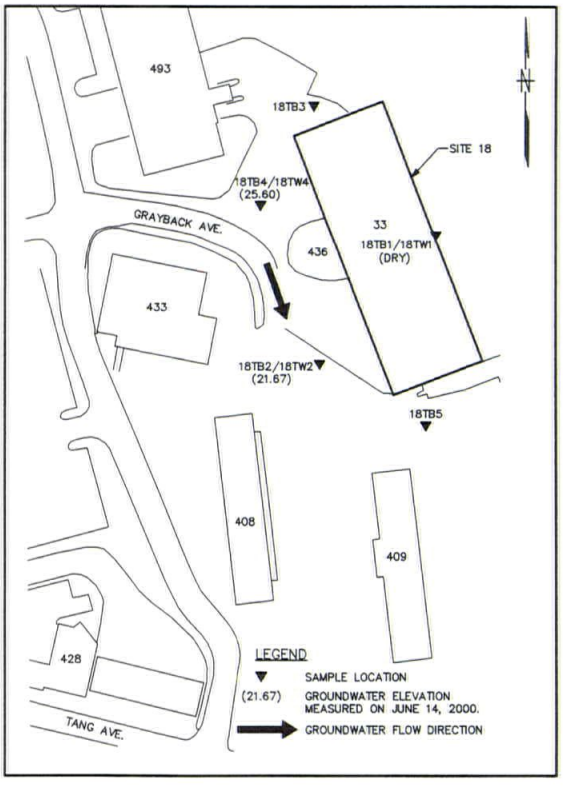

Figure 4. Site 18 Layout Map

rections at Sites 3, 7, 14, and 20 are presented on Figures 5 and 6, respectively. Sites 14 and 20 are located hydraulically upgradient of Sites 3 and 7. Groundwater flow directions at Sites 15 and 18 are shown on Figures 3 and 4, respectively. **Risk assessments** were also performed to evaluate the potential effects of the **contamination** found in the **groundwater** at Sites 3, 7, 14, 15, 18, and 20 on human health and the environment.

Chlorinated **volatile organic compounds** (**VOCs**) (e.g., cis-1,2-dichloroethene, TCE, and vinyl chloride) and **PAHs** were the primary contaminants detected in the **groundwater** at Site 3. Chlorinated **VOCs** were detected during all of the investigations, and it is likely that their detections are the result of solvents being originally released to **groundwater** via the two septic systems and associated leach fields at Site 7 and migrating downgradient to Site 3. No other potential **source** of the **contamination** was found in the area. Use of the septic systems and leach fields at Site 7 was terminated in 1983 when sanitary sewers were installed. The concentrations of the **VOCs** detected during the most recent investigation (2002) were lower than concentrations detected during previous investigations (1994), indicating that a continuing **source** of **contamination** is not present and that **natural degradation** processes are working. The **VOCs** were found primarily along the length of Stream 5 (Figure 7). The **PAHs**, which were detected infrequently, were found to be related to suspended solids in samples collected from recently installed and sampled temporary wells and not a site-specific **groundwater** concern. The results of the **risk assessment** showed that there are no unacceptable risks to current receptors from exposure to contaminants in Site 3 **groundwater**, but the maximum concentrations of TCE and vinyl chloride in Site 3 **groundwater** could result in unacceptable risks to hypothetical future human receptors if they regularly consume the **groundwater** over a prolonged period of time.

Investigations at Site 7 found contaminants such as benzene, chlorobenzenes (1,4-dichlorobenzene, chlorobenzene, and hexachlorobenzene), phenanthrene, and TCE in the **groundwater** (Figure 8). The contaminants were probably released to the **groundwater** via the two septic systems and associated leach fields historically used at the site. The results of the **risk assessment** showed that there are no unacceptable risks to current receptors from exposure to contaminants in Site 7 **groundwater**, but the maximum concentrations of benzene, chlorobenzenes, and TCE in Site 7 **groundwater** could result in unacceptable risks to hypothetical future human receptors if they regularly consume the **groundwater** over prolonged periods of time. The initial screening of the analytical data also indicated that the maximum concentrations of hexachlorobenzene and phenanthrene posed a potential migration issue from **groundwater** to surface water. However, upon further evaluation of frequency of detection information, the potential migration issue was determined to be insignificant.

The **groundwater** chemicals of concern (COCs) for Sites 3 and 7, based on the investigations and **risk assessments** that were conducted, and the remedial goals selected for each of the COCs are as follows:

Chemical of Concern (Site)	Remedial Goal for Protection of Future Receptors
Volatile Organic Compounds	
1,4-Dichlorobenzene (Site 7)	75 **micrograms per liter (µg/L)**
Benzene (Site 7)	1 **µg/L**
Chlorobenzene (Site 7)	100 **µg/L**
TCE (Sites 3/7)	5 **µg/L**
Vinyl Chloride (Site 3)	2 **µg/L**
Semi-volatile Organic Compounds	
Hexachlorobenzene (Sites 3/7)	1 **µg/L**

It is the Navy's current judgement that the Preferred Alternative for Sites 3 and 7 identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of pollutant or contaminants in the **groundwater** at Sites 3 and 7, which comprise a portion of **OU9**, because they may present an imminent and substantial endangerment to public health or welfare.

A single **groundwater monitoring** well was installed at Site 14. It was sampled in 1994 and 2000. Naturally occurring **metals** were the only chemicals consistently detected in the **groundwater** at this site. Evaluation of the Site 14 analytical data indicated that there are no adverse health effects anticipated from exposure to **groundwater** at the site.

After the TCRA at Site 15, **groundwater** samples were collected at the site during the **BGOURI**. The **BGOURI** identified TCE and **metals** as the **groundwater** chemicals of potential concern (COPCs). TCE had not been detected in previous sampling events. Additional soil and **groundwater** samples were collected during the **DGI** in 2002 to confirm the results of the **BGOURI**, to further define the nature and extent of **contamination** at the site, and to determine the risks to human receptors from exposure to Site 15 soil and groundwater. TCE was not detected in the **DGI groundwater** samples, which indicated that the detections of TCE found in **groundwater** samples during the **BGOURI** were anomalies and not indicative of

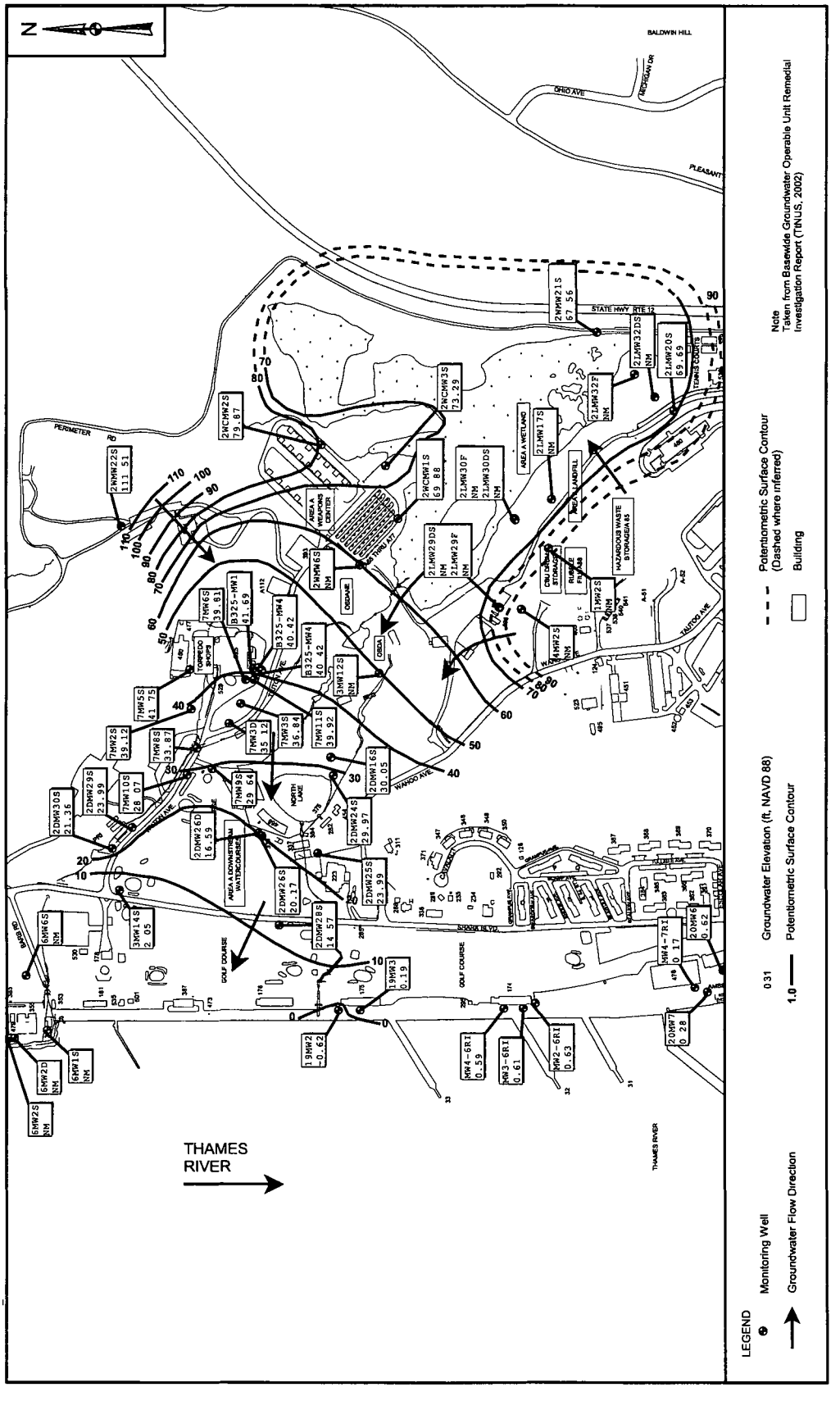

Figure 5. Shallow Overburden Potentiometric Surface Map, August 2000

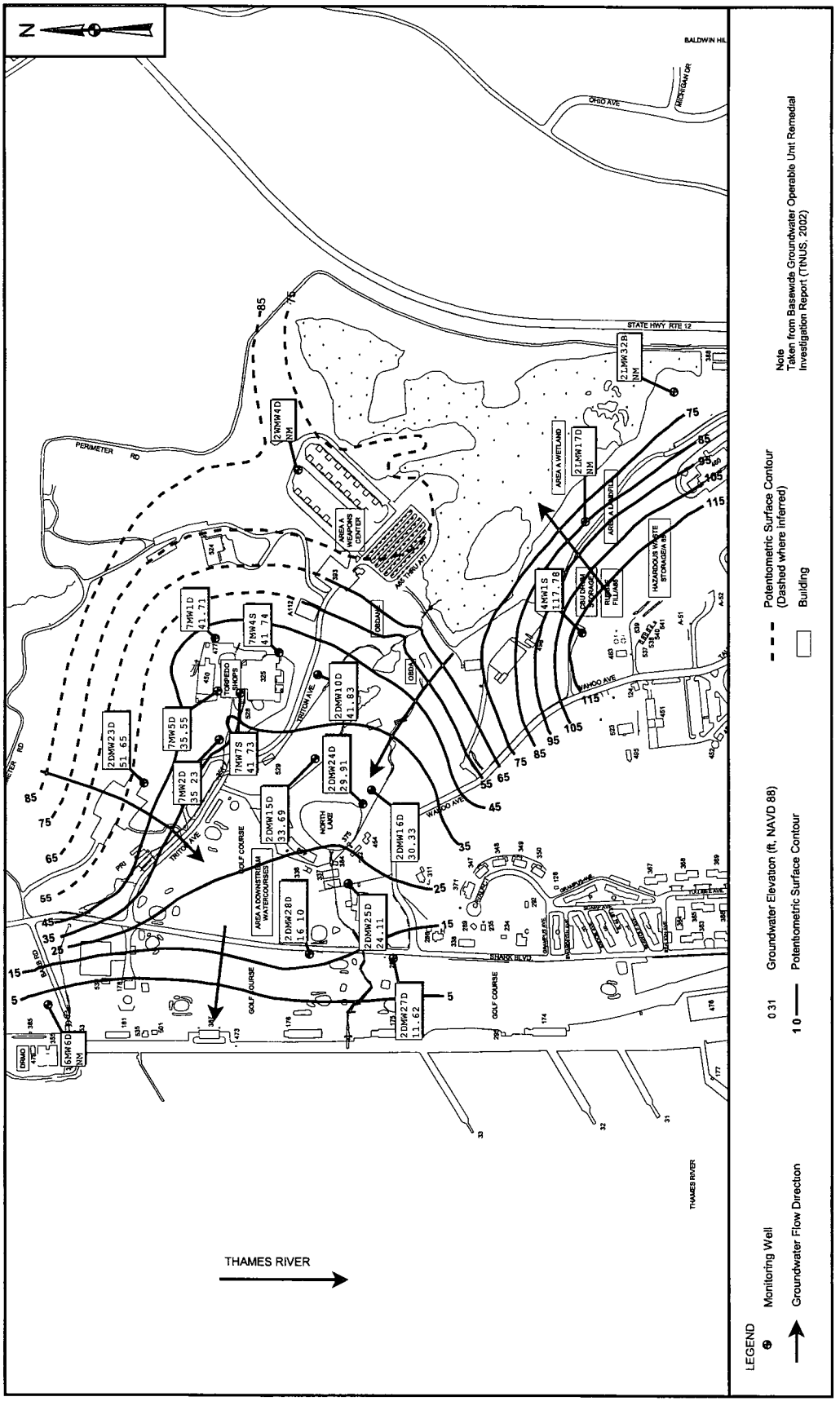

Figure 6. Bedrock Potentiometric Surface Map, August 2000

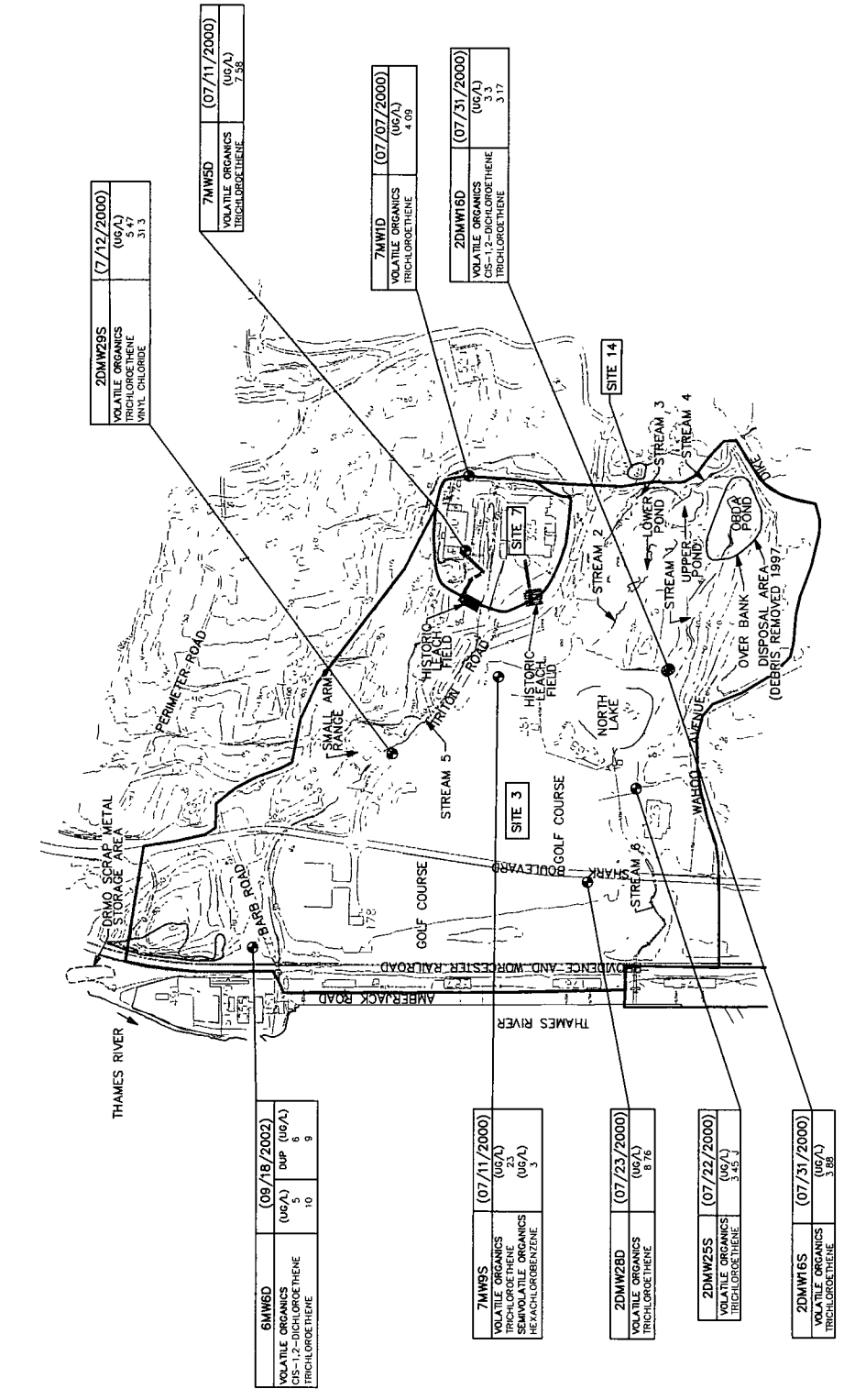

Figure 7. Significant Groundwater Contamination at Sites 3 and 7

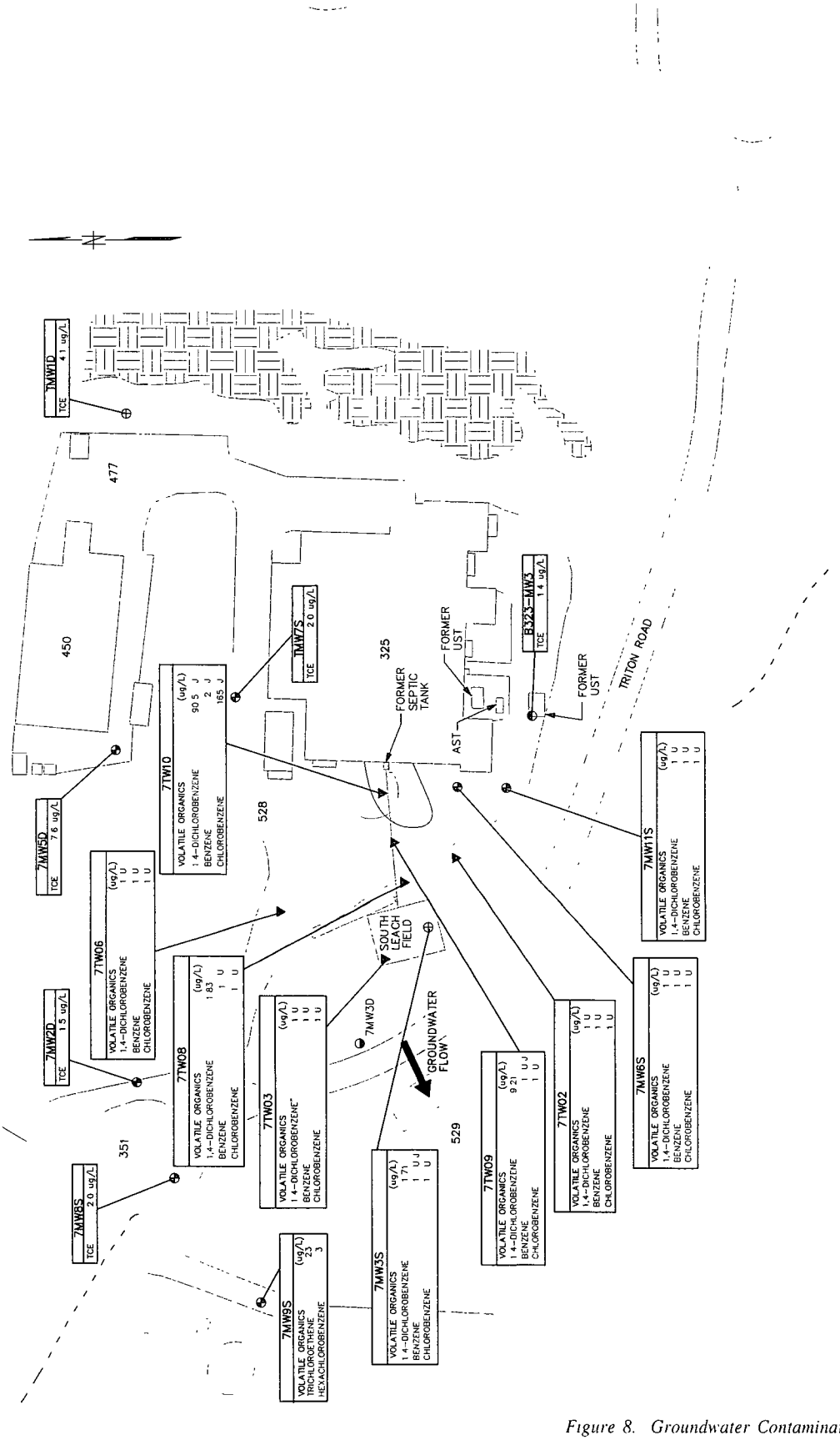

Figure 8. Groundwater Contamination at Site 7

a site or upgradient **source** issue. The **metals** cadmium, chromium, lead, nickel, silver, and zinc were identified as **groundwater** COPCs at Site 15 during the **BGOURI**. The results of the **DGI** showed that the chromium, lead, nickel, and silver concentrations were also anomalies and that the elevated concentrations may have been a result of the field sampling methodology and/or laboratory issues.

The **risk assessment** and data screening completed with the **DGI** results showed that there are no **groundwater** COCs for Site 15. The **risk assessment** was performed for construction workers and future adult residents. The results of the **risk assessment** indicated that the risks from exposure to **groundwater** were within United States Environmental Protection Agency's (EPA's) and Connecticut Department of Environmental Protection's (CTDEP's) acceptable risk levels.

At Site 18, no significant **groundwater contamination** was identified during the **BGOURI**. No **groundwater** COPCs were identified for Site 18 during the data screening portion of the **risk assessment**. The results of the **RI** did not indicate that subsequent rounds of investigation were necessary to further characterize the site or that an **FS** was necessary for the site.

The overburden and bedrock **groundwater** at Site 20 was characterized during three separate investigations. **VOCs** and **semi-volatile organic compounds** (**SVOCs**) were detected sporadically at low concentrations in the overburden and bedrock **groundwater** during the investigations. Naturally occurring **metals** were detected consistently in the **groundwater**. Initial evaluations of risks related to the site's **groundwater** indicated potentially unacceptable risks. The results from subsequent investigations and **risk assessments** showed that the results from the initial risk evaluation were overly conservative and not representative of actual site risks. Changes in the methodologies for **risk assessments**, sample analysis, and sample collection all contributed to the change. The latest results showed that there are no adverse health effects anticipated from exposure to Site 20 **groundwater**.

It is the Navy's current judgement that NFA is necessary for the **groundwater** at Sites 14, 15, 18, and 20 because

What is Risk and How is it Calculated?

A **human health risk assessment** estimates "baseline risk." This is an estimate of the likelihood of health problems occurring if no cleanup action were taken at a site. To estimate baseline risk at a site, the Navy undertakes a four-step process:

Step 1: Analyze **Contamination**
Step 2: Estimate Exposure
Step 3: Assess Potential Health Dangers
Step 4: Characterize Site Risk

In Step 1, the Navy looks at the concentrations of contaminants found at a site as well as past scientific studies on the effects these contaminants have had on people (or animals, when human studies are unavailable). Comparisons between site-specific concentrations and concentrations reported in past studies help the Navy to determine which contaminants are most likely to pose the greatest threat to human health.

In Step 2, the Navy considers the different ways that people might be exposed to the contaminants identified in Step 1, the concentrations that people might be exposed to, and the potential frequency and duration of exposure. Using this information, the Navy calculates a "reasonable maximum exposure" (RME) scenario, which portrays the highest level of human exposure that could reasonably be expected to occur.

In Step 3, the Navy uses the information from Step 2 combined with information on the toxicity of each chemical to assess potential health risks. The likelihood of any kind of cancer resulting from exposure to a site is generally expressed as an upper bound probability; for example, a "1 in 10,000 chance." In other words, for every 10,000 people that could be exposed, one extra cancer may occur as a result of exposure to site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected to from all other causes. For non-cancer health effects, the Navy calculated a "hazard index." The key concept here is that a "threshold level" (measured usually as a hazard index of less than 1) exists below which non-cancer health effects are no longer predicted.

In Step 4, the Navy determines whether site risks are great enough to cause health problems for people at or near the site. The results of the three previous steps are combined, evaluated, and summarized. The Navy adds up the potential risks from the individual contaminants to determine the total risk resulting from the site.

it does not present any significant risk to public health or welfare.

Summary of Alternatives Considered for OU9

The Navy prepared separate **FS**s to evaluate remedial alternatives for the **groundwater** at Sites 3 and 7, but **FS**s were not prepared for Sites 14, 15, 18, or 20 because there were no COCs for the sites. One **FS** involved development and evaluation of alternatives that would address the COCs detected exclusively at Site 3 (vinyl chloride) and the COCs detected at both Sites 3 and 7 (TCE and hexachlorobenzene). The other **FS** involved preparation and evaluation of alternatives that addressed the COCs detected exclusively at Site 7 (1,4-dichlorobenzene, benzene, and chlorobenzene). The alternatives evaluated in the two **FS**s are described separately below.

The two alternatives evaluated in the **FS** for combined Sites 3 and 7 **groundwater** included Alternative GW1-1 (No Action) and Alternative GW1-2 (Institutional Controls with **Monitoring**). Active **groundwater** remedial technologies were evaluated but not retained for alternative development because of the absence of a contaminant plume. Alternative GW1-1 was evaluated for comparison purposes, and Alternative GW1-2 was evaluated because of site conditions (generally low concentrations of contaminants, **groundwater** not classified as a suitable potable water **source**, and the availability and use of a public water supply) and its ability to meet the Remedial Action Objectives (RAOs). The RAOs as defined in the **FS** are: (1) to protect current receptors (construction workers) from incidental exposure to contaminated **groundwater**, (2) to protect potential future receptors from exposure to contaminated **groundwater** via ingestion (potable water supply), and (3) to protect aquatic ecological receptors. The adjacent table summarizes the remedial alternatives considered in the **FS**. Estimated costs are presented including capital, operation and maintenance (O&M), and total present worth costs.

The three alternatives evaluated in the **FS** for Site 7 **groundwater** included Alternative GW2-1 (No Action), Alternative GW2-2 (Institutional Controls with **Monitoring**), and Alternative GW2-3 (Extraction and Off-Site Discharge). Alternative GW2-1 was evaluated for comparison purposes, and Alternatives GW2-2 and GW2-3 were evaluated because of site conditions and their ability to meet the RAOs. The RAOs for this **FS** were the same as for the other **FS**. The table on Page 13 summarizes the remedial alternatives considered in the Site 7 **groundwater FS**.

Remedial Alternatives	Components	Comments
Alternative GW1-1: **No Action**	None, except mandatory 5-year site reviews.	This alternative is not expected to be fully protective of human health and the environment because of unrestricted access to contaminated **groundwater**. Capital Cost = $0 O&M Costs (Present Worth) = $89,600 Total Present Worth Cost = $89,600 (30 years)
Alternative GW1-2: **Institutional Controls with Monitoring**	Implement institutional controls that identify the location and magnitude of **groundwater contamination** and restrict extraction and use of **groundwater**. Monitor the degradation and potential migration of **groundwater** contaminants until they decrease to the remedial goals by natural processes. Conduct 5-year site reviews.	Under this alternative, human health and the environment would be protected through institutional controls that identify the location and magnitude of **groundwater contamination** and restrict extraction and use of **groundwater** and through monitoring the degradation of the **groundwater** contaminants at the site. Capital Cost = $59,200 O&M Costs (Present Worth) = $260,300 Total Present Worth Cost = $319,500 (30 years)

Remedial Alternatives	Components	Comments
Alternative GW2-1: **No Action**	None, except mandatory 5-year site reviews.	This alternative is not expected to be fully protective of human health and the environment because of unrestricted access to contaminated **groundwater** Capital Cost = $0 O&M Costs (Present Worth) = $89,600 Total Present Worth Cost = $89,600 (30 years)
Alternative GW2-2: **Institutional Controls with Monitoring**	Implement institutional controls that identify the location and magnitude of **groundwater contamination** and restrict extraction and use of **groundwater**. Monitor the degradation and potential migration of **groundwater** contaminants until they decrease to the remedial goals by natural processes. Conduct 5-year site reviews.	Under this alternative, human health and the environment would be protected through institutional controls that identify the location and magnitude of **groundwater contamination** and restrict extraction and use of **groundwater** and through **monitoring** the degradation of the **groundwater** contaminants at the site. Capital Cost = $59,700 O&M Costs (Present Worth) = $244,100 Total Present Worth Cost = $303,800 (30 years)
Alternative GW2-3: **Extraction and Off-Site Discharge**	Install **groundwater** extraction and **monitoring** system. Extract approximately 1,250,000 gallons of **groundwater** over nearly 8 months. Pretreat extracted **groundwater**, if necessary, and discharge water to Publicly-Owned Treatment Works Perform **monitoring** to confirm achievement of the remedial goals. Decommision the extraction system and restore the site to its original conditions.	Under this alternative, human health and the environment would be protected because the contaminated **groundwater** would be extracted from the site, treated as necessary, and discharged. Capital Cost = $1,018,600 O&M Costs (Present Worth) - $105,500 Total Present Worth Costs = $1,121,000 (1 5 years)

Alternatives Evaluation Criteria

The following is a summary of the nine Superfund-mandated criteria used to balance the pros and cons of the remedial alternatives. The **FS** alternatives were evaluated using the first seven criteria. After comments from the State of Connecticut and public are received, the alternatives will be compared using the last two criteria to select the interim remedy for Sites 3 and 7 **groundwater**.

1. **Overall protection of human health and the environment:** The alternative should protect human health as well as plant and animal life on and near the site.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs):** The alternative should meet applicable and relevant and appropriate federal and State environmental statutes, regulations, and requirements.

3. **Long-term effectiveness and permanence:** The alternative should maintain reliable protection of human health and the environment over time.

4. **Reduction of toxicity, mobility, or volume through treatment:** CERCLA contains the statutory preference that the selected alternative should use treatment to permanently reduce the level of toxicity of contaminants at the site, the spread of contaminants away from the **source** of **contamination**, or the amount of **contamination** at the site.

5. **Short-term effectiveness:** The alternative should minimize short-term hazards to workers, residents, or the environment during implementation of the remedy.

6. **Implementability:** The alternative should be technically feasible, and the materials and services needed to implement the remedy should be readily available.

7. **Cost:** Capital costs, annual operation and maintenance costs, and their associated net present values of all alternatives retained for detailed analysis shall be compared.

8. **State acceptance:** The State environmental agencies should agree with the proposed remedy.

9. **Community acceptance:** The community should agree with the proposed remedy. Community acceptance is based on comments received during the public meeting and public comment period.

The Navy's Proposed Remedies

The Navy reviewed the results of the two **FS**s and decided that it was appropriate to select one interim remedial alternative that could address **groundwater contamination** found in the portion of **OU**9 associated with Sites 3 and 7 (see Figures 9 and 10). The portions of **OU**9 that are not covered by the interim **ROD** will be addressed in the final **ROD** for **OU**9. The proposed alternative is Institutional Controls with **Monitoring**. This alternative was evaluated as Alternatives GW1-2 and GW2-2 in the two **FS**s. The alternative meets all of the RAOs by restricting access to and use of contaminated **groundwater** and **monitoring** the natural contaminant reduction and potential migration of contaminated **groundwater** at the site. This remedial alternative consists of three major components: (1) implement institutional controls at the sites, (2) conduct a comprehensive **monitoring** program to track the reduction of site contaminants by natural processes until they reach the remedial goals and the resulting concentrations are shown to be protective of human health and the environment, and to verify that **groundwater** contaminants are not migrating and impacting other resources, and (3) complete 5-year reviews of the site until the remedial goals are reached. The components of the alternative are discussed in more detail below.

- Implementation of institutional controls at the sites would involve identifying the location, magnitude, and type of **contamination** and documenting it in the NSB-NLON IR Site Use Restrictions document. This document currently includes soil land use controls, but it will be amended to include specific drawings and instructions for Navy personnel so that contaminated **groundwater** would not be extracted or used in a manner that would threaten human health or the environment. Figure 9 shows the areas of Sites 3 and 7 that will have groundwater land use controls. Figure 10 shows the location of Operable Unit 9 and the status of groundwater land use controls at all of the IR Program sites at NSB-NLON. Areas of NSB-NLON with soil land use controls are shown on Figure 11. In the event of property transfer, and with confirmation that contaminated **groundwater** remains at the site, a deed notification or other applicable land use restriction will be used to prohibit the use of **groundwater**.

- A **groundwater monitoring** plan would be developed to document the details of the **monitoring** program. Approximately nine additional **monitoring** wells would be installed and used in conjunction with existing **monitoring** wells to create the **monitoring** well network required for the Sites 3 and 7 **monitoring** program. During each sampling event all wells within the **monitoring** network will be sampled. Initially, sampling events will occur frequently (e.g., quarterly) and then the sampling frequency would be reduced (e.g., yearly to every 5 years) after sufficient data is acquired. Based on the contaminants at the sites, it is possible that **monitoring** activities will be required for decades until the remedial goals are reached and the resulting concentratons are shown to be protective of the human health and the environment.

- Five-year reviews will be conducted for Sites 3 and 7 **groundwater** as required under CERCLA until the **monitoring** program shows that the remedial goals have been reached. The goal of conducting the site reviews is to verify that no changes have occurred that would impact the effectiveness of the selected remedy.

The Navy also recommends NFA for the portion of **OU**9 associated with Sites 14, 15, 18, and 20 (see Figure 10). Available information indicates that the **groundwater** at these sites does not pose any significant risks to human health or the environment.

Based on information currently available, the Navy believes the Preferred Alternatives meet the threshold criteria and provide the best balance of tradeoffs among the other alternatives with respect to balancing and modifying criteria. The Navy expects the Preferred Alternatives to satisfy the following statutory requirements of CERCLA §112(b): (a) be protective of human health and the environment; (b) comply with **ARARs**; (c) be cost-effective; (d) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (e) satisfy the preference for treatment as a principal element or explain why the preference for treatment will not be met.

The EPA and CTDEP concur with the Navy's proposed interim remedies.

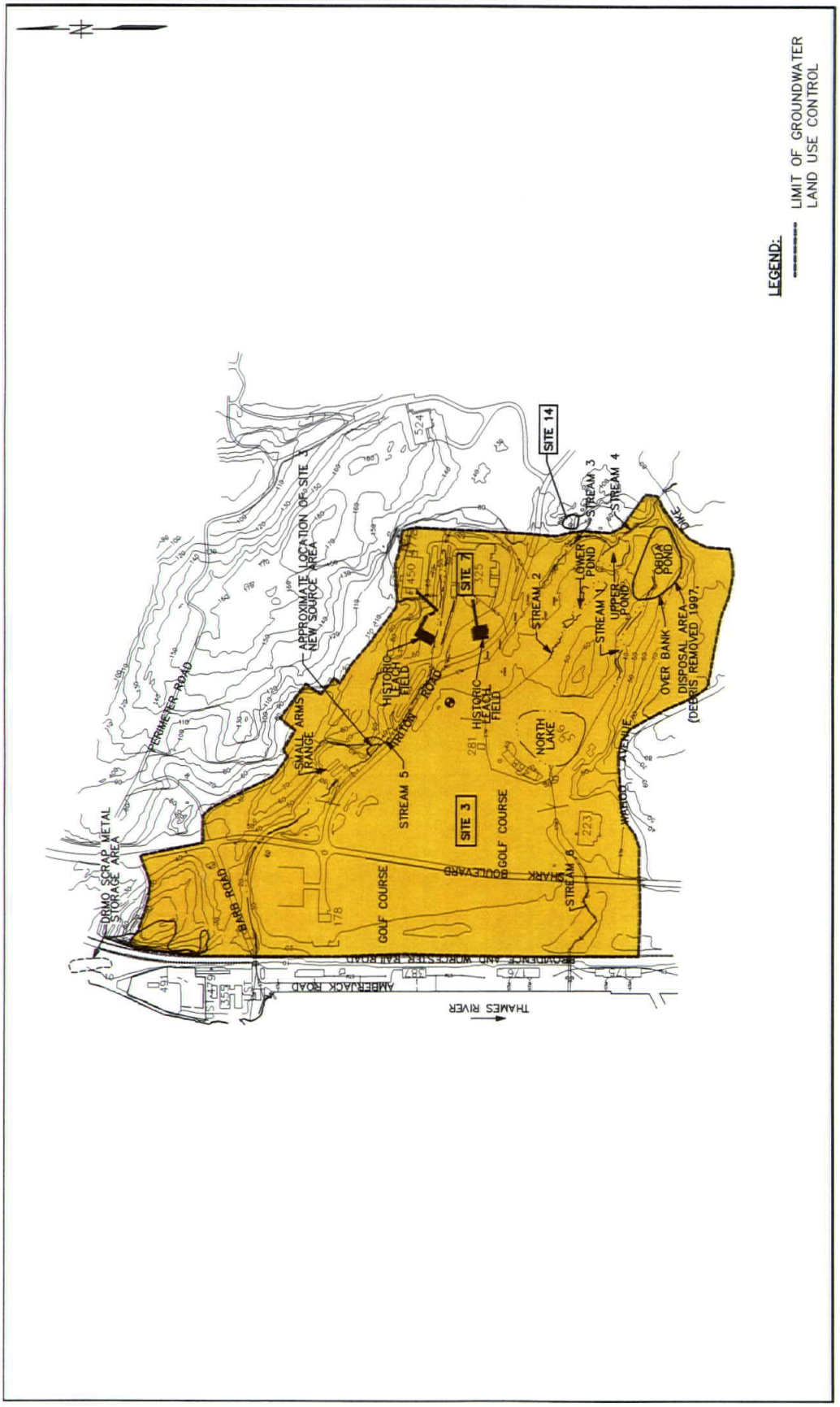

Figure 9. Location of Areas at Sites 3 and 7 That Will Have Groundwater Land Use Controls

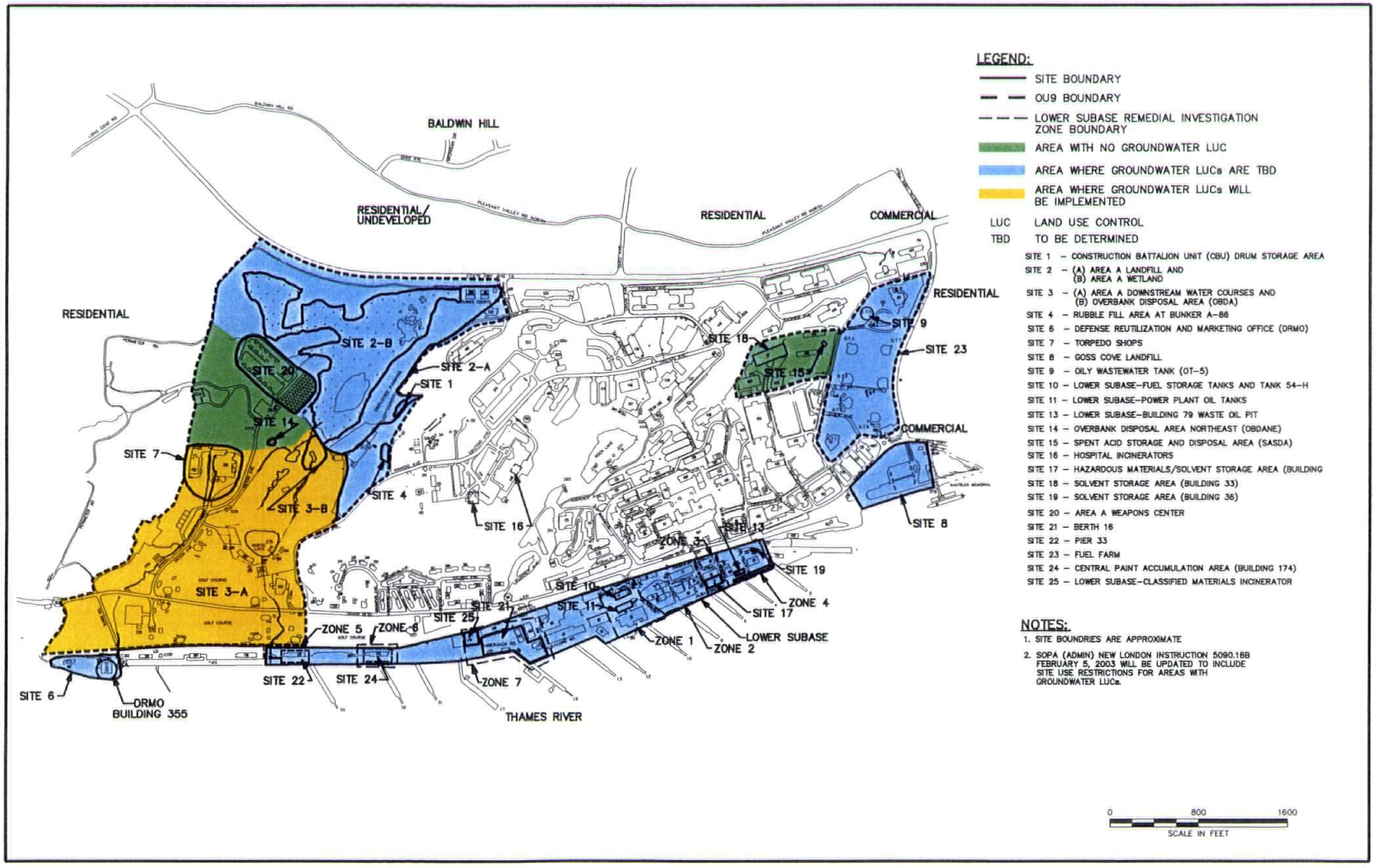

Figure 10. Location of Basewide Groundwater Operable Unit 9 and Areas with Groundwater Land Use Controls

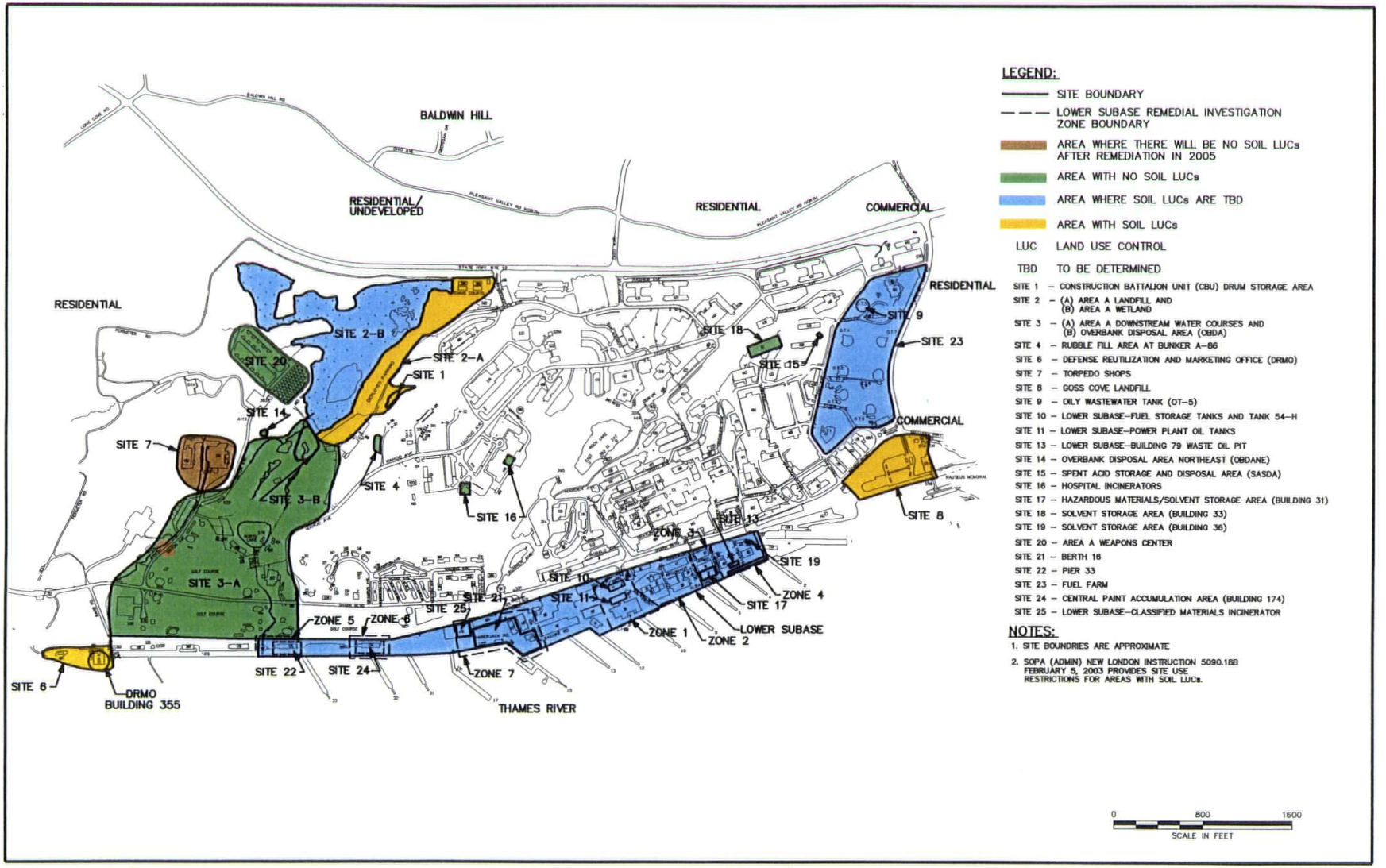

Figure 11. Location of Areas at NSB-NLON with Soil Land Use Controls

The Public's Role in Alternative Selection

Community input is integral to the selection process. The Navy and regulatory agencies will consider all comments in selecting the remedial action prior to signing the Interim **ROD**. The public is encouraged to participate in the decision-making process.

This Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 **groundwater** is available for review, along with supplemental documentation, at the following Information Repositories:

Groton Public Library
52 Newtown Road
Groton, CT 06340
(860) 441-6750

Hours:
Mon. - Thur.: 9:00am - 9:00pm
Fri.: 9:00am - 5:30pm
Sat.: 9:00am - 5:00pm
Sun.: Noon - 6:00pm

Bill Library
718 Colonel Ledyard Highway
Ledyard, CT 06339
(860) 464-9912

Hours:
Mon. - Thur.: 9:00am - 9:00pm
Fri. & Sat.: 9:00am - 5:00pm
Sun.: 1:00pm - 5:00pm

For further information, please contact:

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Glossary of Technical Terms

Applicable or Relevant and Appropriate Requirements (ARARs): The federal and state environmental rules, regulations, and criteria that must be met by the selected remedy under Superfund.

Basewide Groundwater Operable Unit Remedial Investigation (BGOURI) Update/Feasibility Study (FS): A Remedial Investigation report describes the site, documents the nature and extent of **contaminants** detected at the site, and presents the results of the **risk assessment**. An **FS** report presents the development, analysis, and comparison of remedial alternatives.

Contamination: Any physical, biological, or radiological substance or matter that, at a certain concentration, could have an adverse effect on human health and the environment.

Groundwater: Water found beneath the earth's surface in the pores of the soil or the cracks in the bedrock. **Groundwater** may transport substances that have percolated downward from the ground surface as it flows towards its point of discharge.

Installation Restoration (IR) Program: The purpose of the program is to identify, investigate, assess, characterize, and clean up or control releases of hazardous substances, and to reduce the risk to human health and the environment from past waste disposal operations and hazardous material spills at Navy activities in a cost-effective manner.

JP-10: A popular missile fuel which is a single-component hydrocarbon ($C_{10}H_{16}$), rather than a mixture of many hydrocarbons. **JP-10** fuel is a storable liquid.

M tals: Metals are naturally occurring elements in the earth. Some **metals**, such as arsenic and mercury, can have toxic effects. Other **metals**, such as iron, are essential to the metabolism of humans and animals.

Micrograms per Liter (µg/L): One part of contaminant in a billion parts of water.

Monitoring: Collection of environmental information that helps to track changes in the magnitude and extent of **contamination** at a site or in the environment.

Natural Degradation: The decrease of contaminant concentrations due to naturally-occurring contaminant degrading and dispersing processes.

Operable Unit (OU): Contaminated media, site, or set of sites that are evaluated as a group.

Otto Fuel II: **Otto Fuel II** is a distinct-smelling, reddish-orange, oily liquid that produces hydrogen cyanide when burned. The U.S. Navy uses **Otto Fuel II** as a fuel for torpedoes and other weapon systems. It is a mixture of three synthetic substances: propylene glycol dinitrate (the major component), 2-nitrodiphenylamine, and dibutyl sebacate.

Polynuclear Aromatic Hydrocarbons (PAHs): High molecular weight, relatively immobile, and moderately toxic organic chemicals featuring multiple benzenic (aromatic) rings in their chemical formula. Typical examples of **PAHs** are naphthalene and phenanthrene.

Record of Decision (ROD): An official document that describes the selected Superfund remedy for a site. The **ROD** documents the remedy selection process and is issued by the Navy and EPA following the public comment period.

Remedial Investigation (RI): A report which describes the site, documents the nature and extent of contaminants detected at the site, and presents the results of the **risk assessment**.

Responsiveness Summary: A summary of written and oral comments received during the public comment period, together with the Navy's and EPA's responses to these comments.

Risk Assessment: Evaluation and estimation of the current and future potential for adverse human health or environmental effects from exposure to contaminants.

Sediment: Soil, sand, and minerals typically transported by erosion from soil to the bottom of surface water bodies such as streams, rivers, ponds, and lakes.

Semi-Volatile Organic Compound (SVOC): Carbon-based chemical compounds that have low vapor pressures and only evaporate at elevated temperatures. **PAHs** are examples of **SVOCs**.

Source(s): Area(s) of a site where **contamination** originated.

TH Dimer: Tetrahydromethylcyclopentadiene, also called RJ-4, is a missile fuel which is used alone or as a component of JP-9 jet fuel.

Volatile Organic Compound (VOC): Carbon-based chemical compounds that have high vapor pressures and evaporate readily at normal temperatures. Examples of **VOCs** are the components of gasoline (i.e., benzene, toluene, ethylbenzene, and xylenes) and solvents (e.g., TCE).

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 **Groundwater**, a portion of **OU**9, at Naval Submarine Base – New London is important to the Navy. Comments provided by the public are valuable in helping the Navy select the interim remedies for **groundwater** at these sites.

You may use the space below to write your comments, then fold and mail. Comments must be postmarked by October 25, 2004. Comments can be submitted via mail or e-mail and should be sent to either of the following addresses:

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Ms. Melissa Cokas
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Tel: (860) 694-5191
e-mail: melissa.cokas@navy.mil

If you have any questions about the comment period, please contact Mr. Mark Evans at (610) 595-0567 ext. 162.

Name _____

Address _____

City _____

State _____ Zip _____

Telephone _____